Before the FEDERAL COMMUNICATIONS COMMISSION Washington, D.C. 20554

In the Matter of)	
)	
Auction of Advanced Wireless Services Licenses)	
Scheduled for June 29, 2006: Comment Sought on)	AU Docket No. 06-30
Reserve Prices or Minimum Opening Bids and)	
Other Procedures)	
)	

COMMENTS OF SPRINT NEXTEL CORPORATION

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Summary

While combinatorial bidding may warrant further exploration, the Bureau's alternative proposal to distribute AWS licenses through both a simultaneous multiple round (SMR) auction and a simultaneous multiple round package bidding auction (SMR-PB) will lead to confusion, inequality, and – absent careful preparation – the concentration of spectrum resources in the hands of licensees that do not necessarily value them the most.

The Bureau's SMR-PB proposal suffers from multiple flaws. First, the SMR-PB proposal may allow large bidders to reduce demand and lower prices. Without careful planning, therefore, strategic bidders in an SMR-PB auction could artificially reduce spectrum auction revenues to the detriment of the American public. Second, an SMR-PB auction may create a threshold problem for small, rural, and other bidders that are only interested in acquiring licenses in discrete portions of the country. Under certain circumstances, two small regional bidders that collectively value their preferred individual licenses more than a national player could still fail to win an SMR-PB auction against a large national bidder that valued those same licenses less highly. Third, the proposal is enormously complex and almost entirely untested. With nearly seventeen million possible bidding packages and just fourteen days to submit initial comments, the Bureau's alternative proposal is simply too much for even the nation's most sophisticated potential bidders to manage. The computational complexity is particularly acute in this case since the Commission has started – but apparently not yet finished – live human experimentation of the proposed auction mechanism to identify flaws in the process and "bugs" in the auction methodology. Fourth and finally, elements of the Bureau's proposal simply exceed the limits of the Commission's statutory authority under the Communications Act of 1934, as amended. For example, the Bureau proposes to use a form of random selection to determine a winner among mutually exclusive licenses that have submitted tie bids; however, the Commission's authority to use this type of random selection mechanism expired nine years ago in 1997.

In short, while SMR-PB may yet serve as a useful tool in the distribution of spectrum licenses, the Commission and potential bidders need time to fully appreciate all the potential ramifications of the approach that the Bureau proposes. Without at least eighteen additional months of preparation, neither the Commission nor potential bidders will fully understand the ramifications of an SMR-PB auction on the scale of the one proposed here, much less the complex interplay of concurrent SMR and SMR-PB auctions. Sprint Nextel Corporation, therefore, recommends the Bureau either adopt standard SMR bidding for all AWS Blocks A-F, or delay the AWS auction until December 29, 2007 to allow for full consideration of the impact of SMR-PB bidding on the AWS auctions process.

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COMMENTS OF SPRINT NEXTEL CORPORATION

I. INTRODUCTION

Sprint Nextel Corporation (Sprint Nextel) supports the proposal of the Wireless

Telecommunications Bureau (Bureau) to require simultaneous multiple round (SMR) bidding in
the Advanced Wireless Services (AWS) auction currently scheduled for June 29, 2006. Sprint

Nextel, however, opposes permitting combinatorial or package bidding on a portion of the

Advanced Wireless Services (AWS) licenses.¹ The Bureau correctly concludes that "[o]ffering all
licenses in a single standard SMR auction will provide bidders with the simplest and most flexible
means of obtaining single AWS licenses."² While combinatorial bidding may warrant further
exploration, the Bureau's alternative proposal to distribute AWS licenses through both an SMR
auction and a simultaneous multiple round package bidding auction (SMR-PB) represents a major
departure from the dozens of spectrum auctions that the Commission has previously conducted – a
departure that will lead to errors, inequality, and, absent careful preparation, the concentration of
spectrum resources in the hands of licensees that do not necessarily value them the most.

In advancing its alternative proposal for an SMR-PB auction, the Bureau provided potential bidders fourteen days to provide initial comment on the Bureau's proposed use of an

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¹ Auction of Advanced Wireless Services Licenses Scheduled for June 29, 2006: Comment Sought on Reserve Prices or Minimum Opening Bids and Other Procedures, DA 06-238, AU Docket No. 06-30, __ FCC Rcd. (WTB, Jan. 31, 2006) (AWS Auction Notice).

² AWS Auction Notice at 5.

auction methodology that has been routinely eschewed due to its inordinate complexity. Fourteen days for initial comments and another fourteen days for reply comments does not offer the public a meaningful opportunity to comment on what will be a major new direction in FCC auction methodologies and priorities. To adopt an SMR-PB auction without affording parties a reasonable period of time to scrutinize the proposal flies in the face of the notice and comment requirements of both the Communications Act and the Administrative Procedure Act.³ Conducting a successful SMR-PB auction will require significantly more analysis, consideration, and preparation than is evidenced in the current proposal.⁴

II. WITHOUT SAFEGUARDS, PACKAGED BIDDING IN THE AWS AUCTION MAY HARM SMALL, MINORITY, AND RURAL BUSINESSES AND MAY REDUCE AWS AUCTION REVENUES.

Unless carefully structured, an SMR-PB auction could allow very large companies to systematically underbid the nation's AWS spectrum resources, potentially denying the American taxpayer billions of dollars in spectrum-auction revenues. "If licenses are mutual substitutes, a buyer seeking to acquire many licenses faces the same problem as a large buyer in any other market: its own large demand may raise prices overall." The buyer naturally anticipates this effect and may reduce its bids for all the licenses, which reduces the revenue generated and undervalues

³ 4 U.S.C. 553(c)("After notice required by this section, the agency shall give interested persons an opportunity to participate in the rule making through submission of written data, views, or arguments with or without opportunity for oral presentation."); 47 U.S.C. § 309(j)(3)(E)(i)(directing the Commission to "ensure that" spectrum auction participants have adequate time "to develop business plans, assess market conditions, and evaluate the availability of equipment for the relevant services."); *see also Asiana Airlines v. FAA*, 134 F.3d 393 (D.C. Cir. 1998) ("rule-making proceedings must provide both notice and *meaningful* opportunity to comment") (emphasis added, citation omitted).

⁴ See, e.g., Reply Comments of T-Mobile USA, Inc. in Experimental Design for Examining Performance Properties of Simultaneous Multiple Round Spectrum License Auctions with and without Combinatorial Bidding, DA 05-1267 (filed June 15, 2005) (T-Mobile Packaged Bidding Experiment Reply Comments) ("A combinatorial auction would unduly complicate planning and bidding for AWS auction participants and could result in a delay of the targeted June 2006 auction date.").

⁵ See Charles River Associations & Market Design, Inc., Report 1B: Package Bidding for Spectrum Licenses, (prepared for FCC, Oct. 1997) (Package Bidding for Spectrum Licenses), available at < http://www.market-design.com/files/97cra-package-bidding-for-spectrum-licenses.pdf>.

the spectrum resource compared to an SMR auction.⁶ A buyer may even acquire more licenses even where no synergies exist among the licenses because "package bids win more often and lead to lower average prices than individual bids." Without careful structuring, therefore, an SMR-PB auction may create strategic incentives for some bidders to reduce demand and lower prices.

The SMR-PB auction that the Bureau proposes can also be inimical to the interest of any licensee that wants to acquire less than all of the licenses at auction in the SMR-PB format. A regional business, for instance, may wish to acquire one of the twenty-four regional economic area grouping (REAG) licenses that the Commission has proposed to auction by SMR-PB, such as the AWS E Block license that covers Puerto Rico. This Puerto Rican regional bidder, however, could lose an SMR-PB auction to another company that values the Puerto Rico license far less than the regional bidder does. Suppose, for example, that the AWS E Block Puerto Rico License is worth \$80 million and the nearby AWS E Block Gulf of Mexico license is worth \$35 million to a small regional bidder based in Puerto Rico. Then suppose another small regional bidder hoping to serve boaters and oil platforms in the Gulf of Mexico values the Gulf of Mexico License at \$70 million and the nearby Puerto Rico license at \$45 million. A third bidder – a large national bidder that eventually wants a national footprint, but does not intend to deploy service primarily in these insular areas – values obtaining both the Gulf of Mexico and Puerto Rico licenses at \$120 million, but assigns no value to obtaining just one of the two licenses. If the large national bidder submits a bid of \$120 million for the package consisting of both the Gulf of Mexico and Puerto Rico licenses, than neither of the small bidders could outbid the national player even though the two regional players collectively valued their preferred individual licenses at \$150 million – a far higher price than the large national bidder was willing to offer. This so-called "threshold problem" harms small

⁶ *Id.* at 5 (recommending discounts to prevent demand reduction).

⁷ *Id.* at 20-21.

and regional operators and the larger public interest in ensuring that licenses are put to their highest valued use.⁸

In the example above, one way in which the two small regional bidders could win against the national bidder who actually values the licenses less than they do is to implicitly coordinate their bids "by understanding what price each bidder would pay in order for the sum of both bids to exceed the large national bidder's package bid." But permitting cooperation has its own costs: namely, the serious risk of improper collusion among bidders. Even if some form of cooperation or "standby queue" were allowed with sufficient safeguards to protect against improper, collusive practices, however, the small Gulf and Puerto Rico bidders in the example above are likely to disagree about their share of the additional amount necessary to outbid the large national player. Because both the smaller regional bidders would want to lower their respective shares of the joint bid, overcoming what economists have termed the "joint value problem" would prove difficult even if the Commission were to relax its anti-collusion rules and permit bidders to share information – a course of action Sprint Nextel strongly opposes given the potential impossibility of drafting safeguards sufficiently rigorous to prevent bidding abuse. 12

⁸ This example of the threshold problem is drawn from a discussion of a similar problem by Charles Noussair, *Innovations in the Design of Bundled-Item Auctions*, 100 Proceedings of the Nat'l Acad. of Sciences 11153 (Sept. 16, 2003), *available at* http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=196847#ref16 (*Design of Bundled-Item Auctions*).

⁹ See generally Design of Bundled-Item Auctions at n.2.

¹⁰ See Package Bidding for Spectrum Licenses at 19-20.

¹¹ For a discussion of the "standby queue" concept, *see Package Bidding for Spectrum Licenses* at 17 (describing the "standby queue" as "a kind of electronic bulletin board on which bidders post offers that are not part of the standing high bids" that may mitigate the bias toward package bidders, but at the "serious risk of collusion").

¹² Design of Bundled-Item Auctions at n.16 (citation omitted).

III. PACKAGED BIDDING IN THE AWS AUCTION WILL PROVE INORDINATELY COMPLEX, IMPOSING A BURDEN THAT EVEN THE NATION'S LARGEST CARRIERS MAY FIND DIFFICULT TO MANAGE.

Combinatorial auctions are inherently complex.¹³ In the SMR-PB auction that the Bureau proposes, a bidder would need to consider an inconceivably large number of packages on which the bidder might want to place bids. In a combinatorial auction, the number of possible combinations (*C*) increases exponentially with the number of licenses (*N*) at the rate $C = 2^N - 1$.¹⁴ As the Bureau observes, "[t]his number can become very large quickly."¹⁵ In this case, for example, the twenty-four licenses that the Bureau proposes to place in an SMR-PB auction would result in *nearly seventeen million different possible license combinations*.¹⁶ Even the most sophisticated bidders would face a severe challenge deciding how to define bidding packages, settling on which license packages to place bids, and determining how much to pay for each package. Moreover, this computational complexity is not purely theoretical. On the contrary, the Bureau concedes that even the smallest and most unsophisticated bidders interested in only one or two of the REAG licenses in AWS Blocks E and F would have to "to place a large number of bids in order to completely express their interests." If bidders did not place a large number of bids, the Commission's bidding management system "may not be able to find a consistent set of smaller bids that collectively exceeds the amount of a large package bid," which would cause bidders interested in

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¹³ See generally, e.g., Yuzo Fujishima et al., *Taming the Computational Complexity of Combinatorial Auctions: Optimal and Approximate Approaches*, Proceedings of the 16th Int'l Joint Conference on Artificial Intelligence, 548-553 (1999), *available at* http://www.cs.ubc.ca/~kevinlb/papers/cass_vsa.pdf; Frank Kelly and Richard Steinberg, *A Combinatorial Auction with Multiple Winners for Universal Service* (June 27, 1998), *available at* http://faculty-gsb.stanford.edu/wilson/archive/E542/classfiles/Kelly_Steinberg_PackageAuction.pdf.

¹⁴ AWS Auction Notice at 5 & n.20.

 $^{^{15}}$ *Id*.

 $^{^{16}}$ Solving for C, the precise number is $(2^{24}-1)$, or 16,777,215 unique combinations.

¹⁷ The Bureau adds that "package bidding under the SMR-PB format may be more complex for bidders if they wish to aggregate *any or all* of a number of licenses because they cannot win a group of licenses unless they have explicitly placed a bid on that exact combination." AWS Auction Notice at 5 (emphasis in original).

small groups or single licenses to lose out to bidders interested in larger agglomerations of licenses.¹⁸

Although the Bureau acknowledges, as it must, that packaged bidding is substantially more complex than standard SMR auctions, ¹⁹ it appears to have failed to appreciate that managing the enormous number of options will require all participants in the auction to develop their own software capable of identifying and pre-selecting preferred license areas and spectrum blocks within the constraints of each bidder's budget and bidding strategy.²⁰ Without ample time to develop responsive software capable of tracking and analyzing the results of each iterative auction round, bidders will face the impossible task of managing an exceptionally complex array of choices during each round of the auction.

The Bureau suggests that it "may decide" to limit the number of bids a bidder may place and limit the number of packages a bidder may define simply to manage the inordinate computational complexity of its proposal both for itself and the bidders. As a preliminary matter, the Bureau likely lacks discretion to constrain the available bidding choices through a novel and largely untested SMR-PB mechanism. Assuming for the sake of argument, however, that the Bureau possesses sufficient authority to prevent legitimate auction participants from placing bids on available licenses, there is little guarantee that the Bureau will properly identify and assemble

¹⁸ AWS Auction Notice at 5.

¹⁹ Id

²⁰ See, e.g., Daniel M. Reeves et al., Exploring Bidding Strategies for Market-Based Scheduling, 39 Decision Support Systems 67, 68 (2005), available at http://www-personal.umich.edu/~jmm/ papers/proof-dexterdss.pdf> ("except under very restrictive assumptions, we do not know the optimal bidding strategy in multiple item simultaneous ascending auctions").

²¹ AWS Auction Notice at 5.

²² See 47 C.F.R. §0.331(d) (limiting the Wireless Telecommunications Bureau to act "upon notices of proposed rulemaking and inquiry, final orders in rulemaking proceedings and inquiry proceedings, and reports arising from any of the foregoing . . . where novel questions of fact, law, or policy are *not* involved") (emphasis added).

those licenses that exhibit synergies common to all bidders into different bidding packages.²³ And even if the Bureau somehow proved able to bundle licenses into packages that are synergetic to every bidder, the sheer scope of the options remaining to licensees might still overwhelm both auction participants and the Commission alike without substantial additional time to prepare for an SMR-PB auction. Accordingly, if the Bureau insists on holding an SMR-PB auction along the lines it proposes, it must delay the AWS auction for a minimum of eighteen months to allow sufficient time for all bidders to understand the auction process and develop the software necessary to manage the myriad decisions associated with each round of the auction based on their unique bidding preferences.

IV. DETERMINING A WINNER OF AN SMR-PB AUCTION MAY PROVE EXCEPTIONALLY DIFFICULT.

With nearly seventeen million bidding combinations possible during each round of the auction, picking the winner of each license presents unique challenges that the Bureau's notice does not even seriously consider much less solve. The Bureau proposes that at the end of each bidding round in the SMR-PB auction the auction system would "determine the set of provisionally winning bids by considering all of the bids that have been placed in the auction and determining which combination of non-overlapping bids yields the highest aggregate gross bid amount while not allowing a bidder to have more than one provisionally winning bid."²⁴ Because no general purpose algorithm will solve every winner determination problem in an SMR-PB auction, the Bureau's precise mathematical programming models for resolving the combinatorial winner may alter the outcome of the auction. Any number of mathematical programming models and bidding languages might serve to determine the winning bidder equally well, but the Bureau remains under some obligation to provide a detailed explanation of its rationale for selecting one preferred

²³ Aleksandar Pekeč & Michael H. Rothkopf, Non-Computational Approaches to Mitigating Computational Problems in Combinatorial Auctions, available at http://dimacs.rutgers.edu/Workshops/AuctionDesign/ PekecRothkopf04.pdf > (Non-Computational Approaches to Combinatorial Auctions), in Combinatorial Auctions (Peter Crampton et al., eds, MIT Press, 2006).

²⁴ AWS Auction Notice at 18.

mechanisms from the host available and then providing a reasonably sufficient period of time for the public to comment upon it.

If past history is any guide, this new SMR-PB auction process the Bureau proposes will experience implementation problems in its initial phases. Untested auction procedures have proved problematic in the past. For example, the Commission learned of the problems of bid signaling, unlimited withdrawals, "fat-fingering" of bids, and the difficulties of not having minimum opening bids for licenses, only *after* it implemented its initial spectrum auctions.²⁵ In this case, the complexity of the AWS auction would likely make these initial missteps look trivial by comparison. Indeed, given the scope of the changes proposed here, eighteen months of additional scrutiny may not be sufficient to ensure the adoption of sufficient safeguards to prevent confusion, error, and abuse.

For its part, the Bureau appears to have taken its proposed AWS auction pricing rules directly from a study it originally commissioned from Decisive Analytics Corporation. As recently as June 2005, however, the Commission was leery enough about the practical utility of this pricing mechanism that it sought comment on a test plan from two economists outside the Commission. Two professors proposed conducting a series of experiments involving 1,734 human subjects to identify "procedural problems and unintended side effects" from an SMR-PB auction as well as to "debug[] software and conduct "pilot studies." The Commission has apparently neither concluded these tests, nor disclosed the test results to the public. Thus, the public has no actual way of verifying that the proposed methodology does not suffer from "procedural problems,"

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²⁵ See generally, e.g., Peter Crampton & Jesse A. Schwartz, *Collusive Bidding: Lessons from the FCC Spectrum Auctions*, 17 J. of Reg. Econ. 229-252 (May 2000), available at http://www.cramton.umd.edu/papers2000-2004/00jre-collusive-bidding-lessons.pdf>.

²⁶ FCC Public Notice, Comment Sought on Experimental Design for Examining Performance Properties of Simultaneous Multiple Round Spectrum License Auctions with and without Combinatorial Bidding, DA 05-1267 (rel. May 2, 2005).

"unintended side effects," or software "bugs" that the Commission sought to explore, understand, and correct through live experimentation.²⁷

Even if one were to assume that knowing the real-world limitations, pitfalls and side effects of the SMR-PB auction that the Bureau proposes were of no importance, it remains vital to a bidder to determine how much more it must bid to become the winning bidder for any given license. In its *AWS Auction Notice*, the Bureau proposes to determine license-specific acceptable bid amounts for the next round "using an algorithm that takes into account the bids placed so far in the auction that include that license." The "current price estimates" that the algorithm would generate would then "form the basis for calculating minimum acceptable bids and the additional increment bid amounts." Computing how much more a losing bidder must bid in order for its bid to become a winning one is one of the enduring problems of all SMR-PB auctions. Even with the resources at Sprint Nextel's disposal, it remains unclear whether this company, or any other, would be able to reliably and independently determine the incremental additional bidding amounts necessary to win specific licenses or aggregations of licenses in an iterative auction where different packages of licenses are selected in each round. Stated more simply, unless bidders fully understand how winners will be selected, bidders cannot be entirely sure that they know how to win. This is a fatal flaw of the SMR-PB auction mechanism proposed here.

Finally, the Bureau proposes that, in the event of a tie among bidders in any given round, the Bureau would select the winning licensee at random using "a random number generator to

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²⁷ In any case, as T-Mobile noted in the comments it filed in the Commission's 2005 *Packaged Bidding Experiment* proceeding, "[a] small, simplified laboratory experiment may have little utility in examining the effects of combinatorial bidding on the large, complex, and critical AWS auction." *See* T-Mobile Packaged Bidding Experiment Reply Comments at 3.

²⁸ AWS Auction Notice at 17.

 $^{^{29}}$ Id

³⁰ Non-Computational Approaches to Combinatorial Auctions at 3.

³¹ Daniel Lehmann et al., *The Winner Determination Problem*, *available at* http://www.cs.cmu.edu/~sandholm/winner-determination-final.pdf>, *in Combinatorial Auctions* (Peter Crampton et al., *eds*, MIT Press, 2006).

select a single provisionally winning bid from among the tied bids."³² The Bureau fails to recognize, however, that the Commission's authority to use random selection to choose between mutually exclusive license applicants expired on July 2, 1997 and has not been renewed.³³ The Commission, therefore, lacks authority to assign licenses using the random-selection, tie-breaking mechanism that the Bureau proposes.

For all of these reasons, the Bureau should forgo an SMR-PB format for the AWS auction. Alternatively, the Bureau must provide significant additional time for bidders to understand how the SMR-PB format would operate and what bids on individual licenses or aggregations of licenses are likely to become winning bids.

V. HOLDING SMR AND SMR-PB AUCTIONS CONCURRENTLY INTRODUCES AN ADDITIONAL AND ENTIRELY UNNECESSARY LAYER OF COMPLEXITY INTO AN ALREADY EXTREMELY DIFFICULT AUCTION FORMAT.

As if an SMR-PB auction standing alone were not enough of a challenge, the Bureau proposes to hold its novel SMR-PB auction for AWS Blocks E and F concurrent with a standard SMR auction for AWS Blocks A, B, C, and D. The Commission has never before held an SMR-PB auction on the scale of the proposed AWS auction, much less concurrent SMR and SMR-PB auctions as the Bureau's notice proposes.³⁴ The Bureau has allotted precious little time to consider the interplay between these two simultaneous auctions or to ensure that this plan will serve the public interest. While concurrent SMR and SMR-PB auctions may permit bidders interested in winning licenses in both auctions to coordinate their bidding across auctions, concurrent auctions would create even more bidding choices on top of the nearly seventeen million bidding options

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³² AWS Auction Notice at 17.

³³ 47 U.S.C. § 309(i)(5)(A) (providing that, except for certain non-commercial licenses, "the Commission shall not issue any license or permit using a system of random selection under this subsection after July 1, 1997") (emphasis added).

³⁴ The FCC used package bidding for the first time in September 2003 in Auction No. 51 for a package of five regional narrowband PCS licenses for the United States. *See* FCC Public Notice, *Regional Narrowband PCS Spectrum Auction Closes, Winning Bidder Announced*, 18 FCC Rcd 19689 (2003). The Commission announced that it would use combinatorial bidding for twelve licenses in the upper 700 MHz band licenses, but later postponed that auction. *See* FCC Public Notice, *Auction of Licenses in the 747-762 and 777-792 MHz Bands (Auction No. 31) is Rescheduled*, 17 FCC Rcd 14546 (2002).

within the SMR-PB auction alone and greatly complicate bidder efforts to manage their bidding eligibility units.

The Bureau indicates that it will "make an effort" to structure concurrent SMR and SMR-PB auctions to allow bidders to participate in both effectively, but the Bureau offers only limited insight into the precise structure, timing, and duration of either of the auctions.³⁵ For instance, the Bureau proposes that "all licenses in both auctions will remain available for bidding until bidding closes simultaneously on all licenses in both auctions."36 Under this scenario, even though no bidder in one auction submits a new bid, the auction would remain open "so long as there are new bids, proactive waivers applied, or withdrawals submitted in the other concurrent AWS auction."³⁷ This open-ended process could require significantly more time to complete and may prove especially burdensome where the bidding on some licenses is less active. For instance, the Bureau's proposal would require the idle bidders on low- or no-activity licensees to remain vigilant against higher bids for long periods of time to prevent high-activity bidders in the other auction from acquiring the low-activity spectrum at a value less than they are willing to pay. Conversely, the high-activity bidder may have already used its activity rule waivers in the high-activity auction and could be at a competitive disadvantage against a low-activity license bidder that did not have to use its activity-rule waivers during the course of the bidding. These two examples, of course, only scratch the surface of the complex interplay between concurrent SMR and SMR-PB auctions. The relationship between the two different types of auctions that the Bureau proposes to hold concurrently is poorly understood and should not be adopted absent empirical research and analysis that is subject to public scrutiny.

³⁵ AWS Auction Notice at 8.

³⁶ *Id.* at 9.

³⁷ Id

VI. CONCLUSION

Holding an SMR-PB auction on June 29, 2006 following a highly abbreviated notice-and-comment period will fail to provide bidders with a transparent, reliable, and fundamentally fair auctions process. In the Bureau's parlance, it is neither "feasible" nor "desirable" to hold an SMR-PB auction in lieu of, or concurrent with, the well established SMR method of auction. By comparison, holding a predictable, equitable, and transparent SMR auction will, as the Bureau notes, "apply a single set of familiar rules to all bidders, bids and licenses." The Bureau should auction AWS licenses using its standard SMR methodology and reject its alternative SMR-PB proposal as unworkable without substantial additional time, scrutiny and debate.

Respectfully submitted,

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³⁸ *Id.* at 5.